



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of: **NAGAI, Shozo et al.**

Group Art Unit: 1742

Serial No.: 09/878,333

Filed: June 12, 2001

For: **A NI-BASE BRAZING ALLOY**

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SEP 15 2003
TC 1700

Examiner: **H.D. Wilkins, III**

P.T.O. Confirmation No.: 2178

RESPONSE

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

September 11, 2003

Sir:

In response to the Office Action dated **May 12, 2003**, Applicants request favorable reconsideration of the above-identified application. Claims 1 and 2 are pending.

Claims 1 and 2 of the present application stand rejected under 35 U.S.C. §103(a) as obvious over *Nagai et al.* in view of *Stern* or *Brill*. Claim 1 also stands rejected under 35 U.S.C. §103(a) as obvious over *Sugiyama* in view of *Brill*. In response thereto, Applicants respectfully traverse, and in furtherance of the traversal, submit herein a Declaration of Shozo Nagai, pursuant to 37 CFR §1.132.

Applicants respectfully submit that the present invention would not have been obvious to one skilled in the art because there is no teaching, suggestion, or motivating disclosure which would lead a skilled artisan to combine the specific combination of elements at the specific weight percentages as disclosed in claims 1 and 2.



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The Office Action asserts that *Nagai et al.* and *Sugiyama* disclose a Ni-based alloy containing weight percentages of Cr, P and Si, which overlap with the current claims. However, neither of the references teach a limitation of adding either Al, Cr, Y or misch metal at a range of 0.01 to 0.1% by weight. Hence, *Brill* and *Stern* have been combined with the above references because of their apparent teaching of adding Al, Cr, Y or a misch metal at 0.01 to 0.1% by weight because these elements at this range increase resistance to oxidation and/or sulfidation.

Applicants respectfully submit that: (1) *Stern* specifically teaches a combination of Al and Y which exceeds the range of the present claims; (2) *Brill* teaches the range of Al, Cr, Y and misch metal for combining with a Ni-based alloy substantially different from that of *Nagai et al.* and *Sugiyama*; and (3) the specific range of Al, Cr, Y or misch metal of claim 1 has unexpected results.

In regard to *Stern*, the reference teaches a combination of Al and Y at a range of 2.51-5.06 wt.% and a Cr amount of 12-14 wt.% (see col. 2, lines 7-14). One skilled in the art reviewing *Stern* would not readily ascertain, in light of *Nagai et al.* or *Sugiyama*, that adding a significantly lower amount of Al and/or Y to the *Nagai et al./Sugiyama* alloys would result in the present invention. Adding Al and Y at the amount disclosed in *Stern* would destroy the benefits of the present invention (see Declaration, page 4, Table 1, nos. 1-5 and nos. C-D).

In regard to *Brill*, the reference does not teach a combination for use as a brazing alloy. In addition, the Ni-alloy disclosed in *Brill* is substantially different from that disclosed in *Nagai et al.* and *Sugiyama*. Specifically, P is added at a substantially lower amount. *Brill* also teaches adding Al, Cr or rare earths at an amount above the claimed amount (see Declaration, page 4). Hence, one

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skilled in the art would not look to *Brill* as motivation to include Al, Cr, Y or misch metal at the specific range of 0.01 to 0.1 wt.% with the Ni-based alloy of *Nagai et al.* or *Sugiyama*.

Hence, in regard to both *Stern* and *Brill*, there is no teaching or suggestion which would lead one skilled in the art to believe there is a reasonable expectation of success (*i.e.*, a proper reduction in oxidation and/or sulfidation will occur) by combining exactly 0.01 to 0.1 by weight of Al, Cr, Y or misch metal with the Ni-based alloys of *Nagai et al.* or *Sugiyama*. In fact, Applicants discovered that this small amount of Al, Y, Cr or misch metal has an unexpected result of extensively improving the transverse rupture strength of the alloy (*see* Declaration, page 4).

Although one skilled in the art, in arguendo, could combine Al, Cr, Y or misch metal, as disclosed in either *Stern* or *Brill*, at some range above that claimed in an obvious attempt to try to increase oxidation/sulfidation resistance, one skilled in the art would not derive or find it obvious to combine 0.01 to 0.1 wt.% of Al, Cr, Y or misch metal with the Ni-based alloys of *Nagai et al.* or *Sugiyama*. This amount is below what is taught, especially in light of the low Cr content of *Stern* and low P content of *Brill* in comparison to *Nagai et al.* and *Sugiyama*. There is definitely no suggestion that transverse rupture strength is markedly improved by this limitation as discovered by the inventors. Hence, Applicants respectfully submit that the present invention is not obvious to one skilled in the art in light of the combined references.

For further explanation of the non-obviousness of the present invention, Applicants refer to the attached Declaration of Inventor Nagai.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact Applicants undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

ARMSTRONG, WESTERMAN & HATTORI, LLP



Stephen G. Adrian
Attorney for Applicants
Reg. No. 32,878

MJC/SGA/rer
Atty. Docket No. **010743**
Suite 1000
1725 K Street, N.W.
Washington, D.C. 20006
(202) 659-2930



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Attachments: Declaration
Petition for Extension of Time w/fee

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